DOCUMENT RESUME

ED 206 969 CG 015 408

AUTHOR Best, Deborah L.; Nance, Time J.
TITLE The Differential Effects of Frustration and Success Upon Competitive and Cooperative Behavior.
PUB DATE Mar 81
NOTE 15p.; Paper presented at the Annual Meeting of the Southeastern Psychological Association (27th, Atlanta, GA, March 25-28, 1981).

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Aggression; Behavior Patterns; *Competition; *Cooperation; *Failure; *Group Behavior; Group Dynamics; Interaction Process Analysis; Problem Solving; *Success
IDENTIFIERS *Frustration

ABSTRACT

Frustration has been primarily investigated in relation to aggressive behaviors, but may elicit other behaviors depending on the responses available to the individual. To test the effects of task frustration and task success on subsequent group behavior, college women (N=80) were randomly assigned to one of four conditions: task success, task frustration, task and personal frustration, and no task control. Subjects in the three experimental conditions completed individual performance tasks followed by a group task using Madsen's Cooperation Board. Subjects in the success condition were more cooperative in the group activity than subjects in the two frustration conditions. Results suggest that frustration can lead to increased competitiveness and decreased cooperation. Individuals under pressure to achieve in a competitive environment may become competitive in social interactions if they experience intellectual failures, even though such competition is non-rewarding. Success in intellectual tasks may promote social cooperation. (Author/JAC)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED206969

THE DIFFERENTIAL EFFECTS OF FRUSTRATION AND SUCCESS UPON COMPETITIVE AND COOPERATIVE BEHAVIOR

Deborah L. Best
Wake Forest University

Tim J. Nance
Duke University

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.

X Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Deborah L. Best

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

CG 015408

Paper presented at the Annual Conference of the Southeastern Psychological Association, Atlanta, GA, March 1981.

The Differential Effects of Frustration and Success Upon Competitive and Cooperative Behavior

Deborah L. Best
Wake Forest University

Tim J. Nance
Duke University

Southeastern Psychological Association, March, 1981, Atlanta, Georgia

Since the classic work of Dollard, Miller and their associates (Dollard, Doob, Miller, Mowrer, & Sears, 1939; Miller, 1941) frustration has been investigated primarily in relation to aggressive behaviors. It has been argued (Buss, 1961), however, that frustration may elicit other behaviors depending upon what responses are available to a person. One possible alternative response which might be extrapolated from the frustration-aggression hypothesis is the tendency for a person to become more competitive in a social situation following a frustrating experience. The present study was designed to examine the effects of task frustration and task success upon subsequent group cooperative performance in a problem-solving situation.

Competition and cooperation in adult interactions have been investigated most frequently using mixed-motive games, e.g., the Prisoner's Dilemma game. Mixed-motive games have been criticized, however, as lacking generalizability (Vinache, 1969). The situations created in these games are highly formalized and artificial; social interaction is either prohibited or is indirect, e.g., passing notes between subjects; and the games are restricted to using only two players at a time. Although mixed-motive games have provided a great deal of information regarding social interactions, other, more creative and flexible methods need to be explored with adults.

One methodology which has been frequently employed in studies of cooperation and competition with children is the Madsen Cooperation Board (Madsen, 1967) which is diagramed in Figure 1. One subject is seated at each corner of the board and each has a dowel stick attached to the end of the string at his/her corner. Each string is connected to the pen in the center of the board and by pulling the dowel sticks it is possible to move the pen to any location on the board. The board is covered with paper which provides a permanent record of the movement of the pen. Because the string is strung through the eyelet at each corner, pulling each dowel stick moves the pen in only one direction--toward the eyelet. Target circles may be positioned on the paper either at each corner of the board or midway between the corners, as is illustrated in Figure 1. We chose to place the circles midway between the corners because this placement required all four subjects to cooperate in order for the pen to pass through any one of the circles. In an individual reward condition, each subject is assigned a target circle and is given a reward each time the pen passes through his/her circle.

The Madsen Cooperation Board procedure creates a more realistic, less structured interaction between subjects than the mixed-motive games. With the cooperation board, face-to-face communication can be assessed as well as the evolution of the group problem-solving processes. Most of the research with children that has used the cooperation board has investigated individual differences in various subject populations (e.g., gender, age, socioeconomic status, urban vs. rural, ethnic and cultural groups). To date, the only experimental manipulations of cooperation and competition with the Madsen board have employed procedural modifications, such as individual vs. group rewards and different placements of target circles. In the present study, we wanted to see if we could manipulate the levels of cooperation and competition that subjects displayed during the cooperation board task. We

thought that creating successful or frustrating experiences during individual performance tasks preceding the Madsen Board task would alter subjects' cooperative and competitive behaviors.

In order to refine our experimental procedures, we carried out a pilot study with 40 college students using the Madsen Board and a preceding puzzle task. One very important finding from the pilot study was that our cooperation board apparatus was only suitable for female subjects. Male subjects were so much stronger than the females that when they pulled on the dowel sticks the strings broke on practically every trial, even though we were using 114 kg test-weight nylon fish line. The only stronger line available was piano wire, and we were afraid of potential injury to the subjects if the metal lines were to break. Therefore, the present study employed only female subjects.

A second adjustment we found necessary was to increase the number of individual tasks which preceded the board game from one puzzle task to several varied types of tasks. Consequently, we decided to use puzzles, block designs, and matrices in the present study.

In the present study, eighty female college students were randomly assigned to one of four treatment conditions: Task Success, Task Frustration, Task and Personal Frustration, and No Task control. These conditions are indicated in Figure 2. Within each treatment condition there were five groups of subjects, with four subjects per group. Subjects in each of the three task conditions engaged in individual performance tasks prior to the group cooperation board task. Subjects in the No Task control condition did not perform any individual tasks prior to the group task. The four experimenters and two confederates who participated in the study were undergraduates.

Three types of individual performance tasks were employed in each condition of the study: A jigsaw puzzle, three block design tasks, and four Raven's Progressive Matrices. For the success condition, a soluble puzzle, consisting of 28 cardboard pieces with the surface painted black, was used. Three simple block designs were employed; two designs were taken from the WISC-R. Three of the more simple (Set B) Raven's matrices were also utilized. For the two frustration conditions, the puzzle used in the success condition was modified to make it insoluble by the substitution of five nonfitting puzzle pieces. The three block designs were more difficult, with two taken from the WAIS, and the three matrices were from Raven's more advanced materials (Raven's Advanced Progressive Matrices, Set II).

Each subject in the three task conditions performed the individual tasks in a separate, soundproof cubicle with a single experimenter present. Subjects were told that the experiment was designed to investigate the relationship between intellectual problem-solving abilities and a group task of motor skills. In the Task Success condition, the experimenters were warm and friendly to the subjects. Each task was timed with no limits imposed. Subject's performance was praised at the conclusion of each task and was recorded as successful on a score sheet visible to the subject. For the two frustration conditions, the experimenters were cool and aloof. Each task was timed and extremely short time limits were imposed. Subjects were told that "past research had shown that 90% of all college students could complete the task within the time limits" (3½ minutes for the insoluble puzzle, 30 sec per block design, and 15 sec per matrix). Following each task, the experimenter recorded incomplete or incorrect on the score sheet and told the subject that her response was a good guess. Only one subject in either of the frustration conditions completed any task within the allotted time.

Task and Personal Frustration condition was procedurally similar to the Task Frustration condition with the addition of an interruption by a confederate. During the puzzle task, a confederate entered the cubicle to sign the required research participation card. She requested the card in a brusk, authoritative manner, distracting the subject from the puzzle for approximately 30 seconds. No additional time was allowed for the puzzle to compensate for the disruption.

Since subjects in the No Task control condition performed no individual tasks, they were simply instructed how to perform the group cooperation board task. The group task was identical for all four experimental conditions.

Following the individual tasks, all four subjects in each condition were assembled in a large room and seated at the corners of the Madsen Cooperation Board shown in Figure 1. Each subject was designated the target circle to the right of her corner and was told that she would receive a nickel each time the pen in the center of the board passed through her circle. Subjects were told that "The pen will move by manipulation of the dowel sticks that are at each of your places." Care was taken not to use the word "pull" in the instructions to avoid establishing a competitive set. Data from the pilot study had suggested that there was an unusually high degree of competition when communication between subjects was not permitted. Consequently, communication was allowed, but no specific reference was made to it in the instructions. Four one-minute trials were run, with nickels being distributed at the end of each trial. Following the group task, each subject went to a cubicle and was questioned about her knowledge of the experiment, any hypotheses she had regarding what the experiment was about, how she felt during the tasks, and was then debriefed about the experiment.

Since the number of nickels won by each subject in the group cooperation task was dependent upon the behavior of the other group members, the number of nickels won by each group in the various treatment conditions was considered

to be the unit of analysis. The means for the group in the four conditions are shown in Figure 3. A multivariate analysis of variance was performed upon these data with the between-subjects factor of experimental conditions and the repeated factor of trials being treated as orthogonal polynomial contrasts (McCall & Appelbaum, 1973). The univariate analysis revealed a significant main effect of experimental conditions, $F(3, 16) = 3.81$, $p < .05$, and the multivariate analysis revealed a significant effect of trials, $F(3, 14) = 6.80$, $p < .005$, with the univariate linear test for trials being significant, $F(1, 16) = 20.21$, $p < .001$. The interaction between conditions and trials was not significant. The mean number of nickels won by each group in each experimental condition on the four cooperation board trials are shown in Figure 3. All four conditions show a linearly increasing trend across trials, but the groups differ in their rate of increase.

Preplanned contrasts in a multivariate analysis were used to examine the differences between the four experimental conditions. The first contrast indicated that groups in the Task Success and the No Task control conditions earned significantly more nickels across the four trials than did the groups in the two frustration conditions, $F(1,16) = 6.75$, $p < .02$. The second contrast indicated that across trials, the Task Success condition groups won significantly more money than did the groups in the two frustration conditions, $F(1, 16) = 8.84$, $p < .009$. The third contrast compared the Task Success groups with the No Task control groups, and the fourth contrast compared the groups in the two frustration conditions. Neither of these contrasts were significant, suggesting that Task Success and No Task control conditions were equivalent, even though there was a trend for the Task Success condition to cooperate more and win more money. Similiarly, the Task Frustration condition did not differ significantly from the Task and Personal Frustration condition, suggesting that the additional personal frustration of interruption during the individual tasks did not lead to more competition during the group task. The

interruption manipulation employed may have been ineffective for inducing frustration. Several other analyses, which will not be reported here, were consistent with the multivariate analyses.

Additional evidence supporting our hypothesis came from the questionnaire data. In each of the four experimental conditions, a group of subjects was classified as "frustrated" if three of the four subjects indicated that they either found the individual tasks difficult or they felt "pushed" by the time constraints, or they explicitly commented about feeling frustrated. Groups not meeting this criterion were classified as nonfrustrated. In the Task Success and No Task control conditions, no groups were classified as frustrated. Four of the five groups in each of the frustration conditions met the frustration criterion. The mean number of nickels won across the four trials by the eight frustrated groups was 9.22, which was significantly less than the mean of 20.04 for the 12 nonfrustrated groups, $t(18) = 4.99$, $p < .01$. Hence, subjects who indicated that they were frustrated by the individual tasks were less cooperative on the group task than subjects who did not report feeling frustrated. In addition, these data indicate that the frustration manipulations were effective since four of five groups in each of the frustration conditions were classified as frustrated on the basis of their own verbal reports, while no groups were so classified in the Task Success or No Task control conditions.

The questionnaire data were examined to see if subjects who reported that they were aware of the experimental hypothesis performed any differently from those who reported that they believed the deceptive information given in the instructions. Subjects were considered aware of the hypothesis if they said that the study dealt with cooperation or competition, or if they indicated that their experience with the individual tasks may have altered their

performance on the group task. Other responses were classified as unaware of the experimental hypothesis. Groups of subjects in each experimental condition were considered aware of the hypothesis if at least two of four subjects in a group were classified as aware of the hypothesis. One group in the Task Success condition and 2 groups in each of the frustration conditions were classified as aware of the hypothesis; all 5 groups in the No Task control were classified as aware of the hypothesis. The mean number of nickels won by the 10 aware groups across the four trials, 16.5, was not significantly different from the mean of 14.9 for the 10 nonaware groups, $t(18) = .21$. Thus, even though subjects could verbalize the necessity to cooperate in order to win money, they still did not cooperate any more than subjects who did not report such information.

To summarize our findings, these data suggest that being frustrated on individual, intellectually-oriented tasks decreased cooperation on a subsequent group task which required cooperative responses to maximize individual gain. In contrast, success on individual tasks increased subsequent group cooperation over that found in the frustration conditions. Task success did not enhance cooperative performance above that of subjects who had no preceding individual tasks. Our most remarkable finding, however, was that following the individual frustration tasks, our college women were unable to solve the group task in order to win money. The ease with which the success and control conditions earned nickels indicates that the solution was not too difficult, and practically every subject reported that she would like to win the money. Nevertheless, in several of the frustrated groups, one subject verbalized the solution and the need to cooperatively take turns in order to win nickels, but her suggestions were always ignored.

Madsen (1971) has proposed that in the United States, the motivation to compete is often so strong that it overcomes any tendency to interact in mutual self-interest, even though the mental capacity to do so is present. (Our data indicate that following frustrating tasks, subject will often adopt a competitive strategy in which relevant information is ignored and personal gain is decreased.) Students, especially those in college, often experience a great deal of pressure to excell in a competitive achievement-oriented evironment. A student who experiences repeated failures in the classroom may become very competitive in social interactions, even though such competition may be inefficient and non-rewarding. On the other hand, success in intellectual tasks may contribute to more cooperative interactions in social situations.

References

Buss, A. The psychology of aggression. New York: Wiley, 1961.

Dollard, J., Doob, L., Miller, N., Mowrer, O., & Sears, R. Frustration and aggression. New Haven: Yale University Press, 1939.

Madsen, M. C. Cooperative and competitive motivation of children in three Mexican subcultures. Psychological Reports, 1967, 20, 1307-1320.

Madsen, M. C. Developmental and cross-cultural differences in the cooperative and competitive behavior of young children. Journal of Cross-Cultural Psychology, 1971, 2(4), 365-371.

McCall, R. B., & Appelbaum, M. I. Bias in the analysis of repeated-measures designs: Some alternative approaches. Child Development, 1973, 44, 401-415.

Miller, N. E. The frustration-aggression hypothesis. Psychological Review, 1941, 48, 337-342.

Vinacke, W. E. Variables in experimental games: toward a field theory. Psychological Bulletin, 1969, 71(4), 293-318.

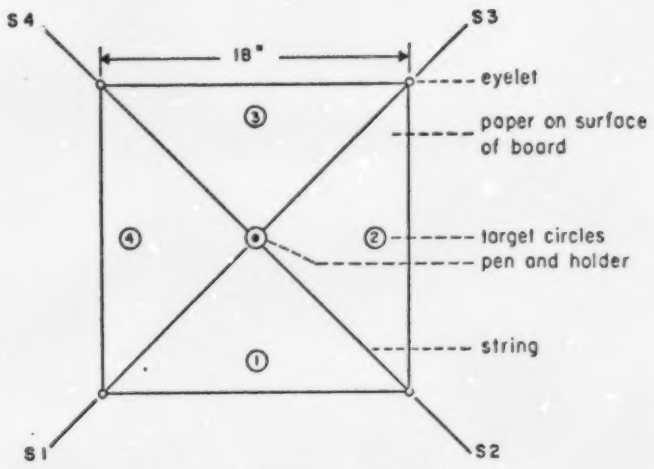

FIG. 1.—Madsen cooperation board

Condition	Individual Tasks	Group Task
Task Success	Soluble Puzzle 3 Simple Block Designs (WISC-R) 3 Simple Raven's Matrices (No time limit)	Madsen Cooperation Board (4 one-minute trials)
Task Frustration	Insoluble Puzzle 3 More Difficult Block Designs (WAIS) 3 Raven's Advanced Matrices (excessively short time limits)	Madsen Cooperation Board (4 one-minute trials)
Task and Personal Frustration	Insoluble Puzzle 3 More Difficult Block Designs (WAIS) 3 Raven's Advanced Matrices Puzzle Task Interruption by Confederate (excessively short time limits)	Madsen Cooperation Board (4 one-minute trials)
No Task Control	No Individual Tasks	Madsen Cooperation Board (4 one-minute trials)

Figure 2. Individual and Group tasks performed by subjects in each of the four experimental conditions.

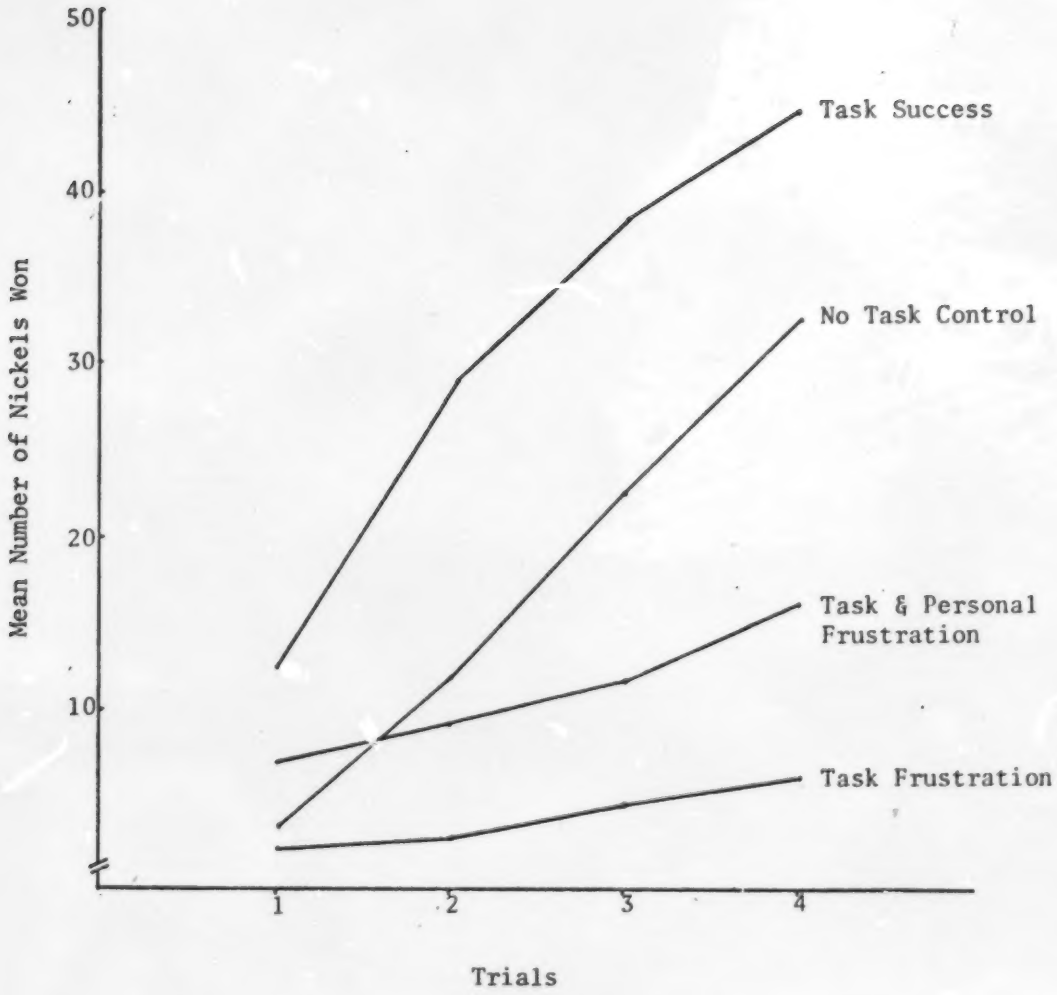

FIGURE 3.

Mean number of nickels won by each group of subjects in the four experimental conditions for the four trials using the Madsen Cooperation Board.

The Differential Effects of Frustration and Success

Upon Competitive and Cooperative Behavior

Deborah L. Best
Wake Forest University

Tim J. Nance
Duke University

Southeastern Psychological Association, March, 1981, Atlanta, Georgia

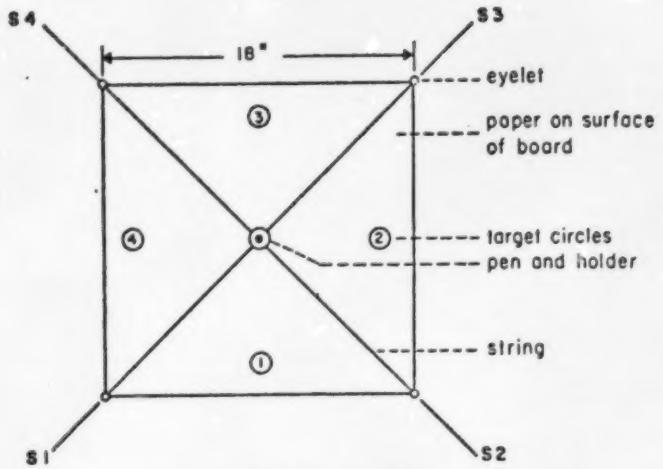

FIG. 1.—Madsen cooperation board

Condition	Individual Tasks	Group Task
Task Success	Soluble Puzzle 3 Simple Block Designs (WISC-R) 3 Simple Raven's Matrices (No time limit)	Madsen Cooperation Board (4 one-minute trials)
Task Frustration	Insoluble Puzzle 3 More Difficult Block Designs (WAIS) 3 Raven's Advanced Matrices (excessively short time limits)	Madsen Cooperation Board (4 one-minute trials)
Task and Personal Frustration	Insoluble Puzzle 3 More Difficult Block Designs (WAIS) 3 Raven's Advanced Matrices Puzzle Task Interruption by Confederate (excessively short time limits)	Madsen Cooperation Board (4 one-minute trials)
No Task Control	No Individual Tasks	Madsen Cooperation Board (4 one-minute trials)

Figure 2. Individual and Group tasks performed by subjects in each of the four experimental conditions.